A new species of vanga (Vangidae, *Calicalicus*) from southwestern Madagascar

by Steven M. Goodman, A. F. A. Hawkins & Charles A. Domergue

Received 19 March 1996

The Red-tailed Vanga *Calicalicus madagascariensis* (Linnaeus, 1766) is the smallest member of the family Vangidae, all of which are forest species and endemic to the Malagasy faunal region (Madagascar and the Comoros). *C. madagascariensis*, the only previously named species of this genus, is an arboreal gleaning insectivore. Red-tailed Vangas often forage on the outer parts of canopy trees and shrubs on medium-sized insects such as caterpillars and crickets (Rand 1936, Langrand 1990, Yamagishi *et al.* 1992, Eguchi *et al.* 1993).

All members of the Vangidae except the Red-tailed Vanga and Blue Vanga *Cyanolanius madagascarinus* are either limited to one of the three major Malagasy biogeographic regions (Eastern, Western and Southern) or have populations divided into subspecies that are restricted to one or two of these regions (Rand 1936, Appert 1968, 1970, Langrand 1990). Thus in general their distributions seem closely linked with vegetational communities.

The Red-tailed Vanga is widely distributed on Madagascar (Fig. 1), though it appears to be absent from a few areas in the northwest (Hawkins 1994) and the extreme south and southwest (Langrand 1990), and it occurs patchily elsewhere in its range (Appert 1968, 1970). No geographic variation has been previously recognized in this species. It is found in all native forest types and in degraded and secondary areas adjacent to primary forest (Rand 1936, Langrand 1990, Hawkins 1994).

In mid-June 1948 Philippe Milon collected two *Calicalicus* near Tuléar (Toliara) in the extreme southwestern corner of the island. After comparison of these two specimens to material of *Calicalicus madagascariensis* from across the island held in the American Museum of Natural History (AMNH), the Natural History Museum (BMNH), the Field Museum of Natural History (FMNH), and Muséum National d'Histoire Naturelle (MNHN), Paris, we have concluded that they represent a distinct and previously undescribed species. Here we propose to call this new species

Calicalicus rufocarpalis sp. nov.

Holotype. Female, Muséum National d'Histoire Naturelle, Paris, 1974.510, Tuléar [=Toliara], Province de Toliara, Madagascar, collected 19 June 1948, by Colonel Philippe Milon; field number PM 4396. The specimen had a granular ovary, measuring 5 × 2 mm, and with small "microscopique" egg follicles.

Further details about the specimen, not written on the museum ticket, are recorded in Milon's field catalogue (MNHN). Soft part

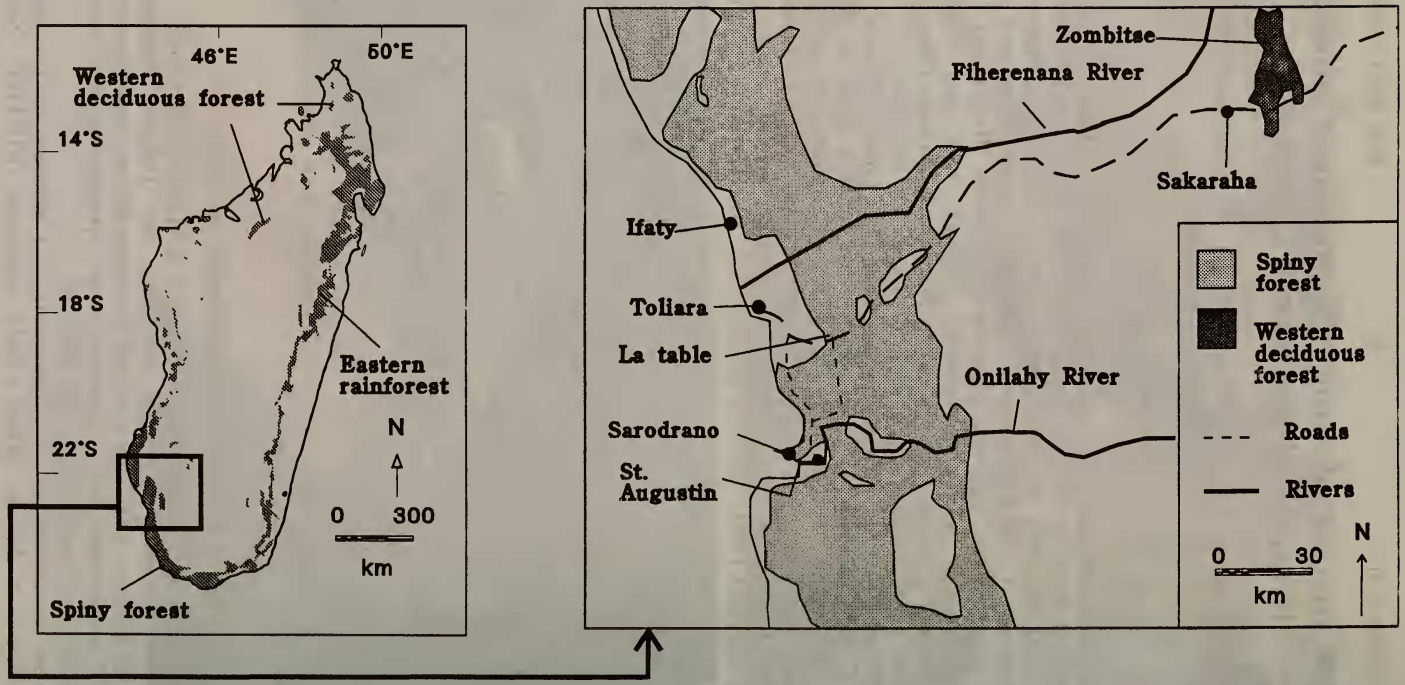

Figure 1. Map of Madagascar showing limit of eastern rainforest and spiny bush. The inset is of southwestern Madagascar.

TABLE 1
Measurements (in mm) and mass (g) of *Calicalicus madagascariensis* and *C. rufocarpalis*

	wing chord	tail	exposed culmen	bill length from anterior edge of nostril	tarsus	weight
rufocarpalis nov. sp.						
MNHN 1974.510♀	64	57	11.9	9.1	23.6	17.4
MNHN 1974.508♀	62	57	11.6	8.5	24.7	16.1
mean	63.0	57.0	11.8	8.8	24.2	16.8
madagascariensis[1]	67.4, 1.88 65–72 (*n*=53)	48.4, 2.04 45–54 (*n*=52)	10.5, 0.52 9.4–11.6 (*n*=53)	7.8, 0.40 7.0–8.7 (*n*=52)	20.4, 0.83 18.5–22.4 (*n*=43)	15.5, 1.5 14.0–18.0 (*n*=6)
statistical comparison (ANOVA)	F=10.9 p=0.002	F=34.5 p=0.0001	F=10.3 p=0.002	F=12.1 p=0.0001	F=38.8 p=0.0001	F=1.1 p=0.34

[1]Sexes combined. Presented as mean, standard deviation, minimum-maximum (number of specimens).

colours: iris lemon with a slight tawny wash, beak brownish-black with greyish-blue near base. Weight: 17.4 g. The bird was collected near La Table [approximately 20 km southeast of Toliara], which is here designated as the type locality. An analysis of its stomach contents conducted by R. Paulian identified one cerambycid beetle and a large grasshopper, almost certainly *Locusta*.

Diagnosis. *Calicalicus rufocarpalis* is distinguished from *C. madagascariensis* by differences in external measurements and plumage characters. Colour names and numbers are after Smithe (1975).

The sample of *C. madagascariensis* (*n*=53) showed no sexual dimorphism in external measurements and in all analyses presented herein sexes of adult specimens are combined. *C. rufocarpalis* has distinctly shorter wings and longer tail, bill and tarsus than *C. madagascariensis* (Table 1). In all cases there is no to little overlap in measurements between these two species and the differences are all statistically significant. There is considerable overlap in weight.

The crown and mantle of female *rufocarpalis* are generally a continuous near Brownish-olive (29) or Olive (30), while in *madagascariensis* the Plumbeous (78) crown contrasts sharply with the Brownish-olive or Olive mantle. The upper wing-coverts of *rufocarpalis* are distinctly Brick-red (132a) which contrasts with the Brownish-olive wing-coverts with Clay-color (26) fringes in female *C. madagascariensis*. The Brick-red pigment on the tail in *rufocarpalis* tends to be restricted to the area bordering the central shaft and absent from the tip, while in *madagascariensis* all the tail feathers, except the central pair, are almost entirely Brick-red. No specimen of male *C. rufocarpalis* is known (see Discussion section).

Measurements of the holotype (mm). Wing (chord) 64, tail 57, exposed culmen 11.9, bill length from anterior edge of nostril 9.1, tarsus 23.6.

Paratype. Female, Muséum National d'Histoire Naturelle, Paris, 1974.508, Tuléar (Toliara), Province de Toliara, Madagascar, collected 17 June 1948, by Colonel Philippe Milon; field number PM 4391 (see Table 1 for measurements).

Other information on this specimen was found in Milon's field catalogue (MNHN). The specimen was collected near a stone quarry at La Table, 13 km southeast of Toliara, and was part of a mixed species foraging flock composed of four or five *Thamnornis chloropetoides*, four or five *Newtonia*, and one *Neomixis striatigula*. The iris was light yellowish-brown and the bill brownish-black with a slightly bluish wash, and greyish-blue at the base. The bird weighed 16.1 g.

Etymology. The name *rufocarpalis* is derived from the Latin and refers to the distinct Brick-red wing converts of females of the new species.

English name. We suggest Red-shouldered Vanga.

Range. Only known from Toliara region of southwestern Madagascar.

Specimens examined. C. rufocarpalis, 2♀♀, Tuléar (Toliara) (MNHN). *C. madagascariensis*, 63♂♂, 52♀♀, 3 unsexed: Anaborano 1♂ (AMNH); Andapa 1♀ (AMNH); Bejofo 1♂, 1♀ (AMNH); Bezona 1♂ (AMNH); Col Pierre Radama 1♂ (AMNH); Eminiminy 1♂ (AMNH); Fanovana 1♂ (BMNH); Fito 2♂♂, 2♀♀ (AMNH), 1♂ (MNHN); Forêt de Vohibasia 1♂ (FMNH); Forêt Sihanaka 4♀♀ (BMNH); Fort Dauphin (Tolagnaro) 1♂, 1♀ (MNHN); Iampasika 1♀ (AMNH), 1♂, 2♀♀ (BMNH), 1♀ (MNHN); Ivohibe 2♂♂, 2♀♀ (AMNH), 1♂ (BMNH), 1♀ (MNHN); Lac Iotry 1♀ (AMNH); Manombo 2♂♂, 2♀♀ (BMNH), 1♂, 1♀ (MNHN); Maroantsetra region 11♂♂, 6♀♀, 2 unsexed (AMNH), 3♂♂, 2♀♀ (MNHN); Maromandia 1♂ (AMNH), 1♂, 1♀ (MNHN); Marotony 2♂♂, 1♀ (AMNH); Montagne d'Ambre 2♂♂, 1♀ (MNHN); Nosy Be 3♂♂ (MNHN); Périnet 2♂♂, 1♀ (MNHN); Sakaraha 1♀ (MNHN); Tabiky 2♂♂, 1♀ (AMNH), 2♂♂ (BMNH), 1♀ (MNHN); Tsarakibany 1♀ (MNHN); Tsiandro 4♂♂, 6♀♀ (AMNH), 4♂♂, 1♀, 1 unsexed (BMNH), 2♂♂, 2♀♀ (MNHN); Vondrozo 4♂♂, 6♀♀ (AMNH), 2♂♂, 1♀ (BMNH), 1♂ (MNHN).

Discussion

The only known material of *C. rufocarpalis* is the holotype and paratype, both females. In both cases, they have Brick-red upperwing-converts, a character in *C. madagascariensis* restricted to males (Langrand 1990). Milon, the collector of both *rufocarpalis* specimens, was clearly aware of the unusual circumstances of a female *Calicalicus* having Brick-red wing-coverts. On the original specimen label, of the holotype, with hand writing in the distinct style of Milon, he underlined the female sex symbol and wrote "ov. [aire] g. [ranulaire] assez important," thus removing any doubt associated with the proper sexing of the specimen. No mention was made of the two Toliara birds in his book on Malagasy birds (Milon *et al.* 1973). In examination of

C. madagascariensis specimens we found a few sub-adult males in female plumage. In all cases, males seem to obtain simultaneously Brick-red wing-coverts and other aspects of the adult male plumage (e.g. black throat feathers). Examples of males in this plumage include individuals taken at Tabiky on 17 November 1929 (AMNH 413072), at Bezona, near Ambanja, on 25 November 1930 (AMNH 413078), and at Vondrozo on 6 July 1929 (BMNH 1931.8.18.1516).

Calicalicus rufocarpalis is only known from the Toliara region, while *C. madagascariensis* occurs in much of the remaining forested areas of the island (Langrand 1990). The nearest known sites to La Table for *C. madagascariensis* are 110 km northeast of Toliara near Sakaraha (MNHN 1973.553), 59 km northeast of Sakaraha in the Forêt de Vohibasia (FMNH 380006), and 32 km north of Toliara near Ifaty (photographed by T. S. Schulenberg). These sites are shown in Figure 1.

A male *Calicalicus* attending a nest was photographed by C.A.D. on 1 March 1991, approximately 22 km southeast of Toliara by road (17 km by air), on the old track to St Augustin. The site (23°26′S, 43°48′E) was located about 500 m south of the turn-off towards Ambohimahavelona, which lies on the Onilahy River, and less than 10 km east of La Table. This individual had a plumage pattern different from typical *C. madagascariensis* (Plate 1). The most noticeable differences of the male in the photograph are the completely rufous upperwing-coverts as well as rufous on the mantle and lower nape as compared to typical *C. madagascariensis* in which the rufous feathers are restricted to the marginal, lesser and some median wing-coverts, and the mantle and upperparts are grey. The photographed bird has a yellow iris and *C. madagascariensis* possesses a dark brown iris. Further, the bird also has a distinctly paler tail and more heavily washed rufous underparts than *C. madagascariensis*. Given the combination of characters, in particular the iris colour, we conclude that the bird photographed by C.A.D. is referable to *C. rufocarpalis*.

Given the limited number of records of *Calicalicus* from the southwest, it is unclear if *C. madagascariensis* and *C. rufocarpalis* are sympatric. The closest known sites of their occurrence are Ifaty (*C. madagascariensis*) and Toliara (*C. rufocarpalis*) which were until recently part of the same forest block, separated only by the seasonal Fiherenana River. Further research is needed to clarify the distribution of these two species in southwestern Madagascar.

C. rufocarpalis has a shorter wing and tail and longer bill and tarsus than *C. madagascariensis*. The forest stature of the spiny bush in the Toliara region is distinctly shorter than that of the dry deciduous forest and humid forest, the latter types being the domain of *C. madagascariensis*. The differences in the measurements of the two species are presumably related to these ecological variables.

The current status of *C. rufocarpalis* is unknown. With the exception of the photo from southeast of Toliara, we are unaware of any recent records of it from the region between the Fiherenana River (north of Toliara and south of Ifaty) south to the Onilahy River (Fig. 1). Within

a few kilometres of the Toliara city centre there still remains some forested areas, although generally degraded. Further, the forests of southwestern Madagascar are under heavy human pressure associated with exploitation of trees for charcoal and timber. Recent fieldwork in the region of Toliara and St Augustin has failed to reveal further records of *C. rufocarpalis* and it is presumed to be rare or sparsely distributed. We strongly suspect that *C. rufocarpalis* has a broader geographic range than currently known. It might be a species associated with the coastal plain and plateau of the calcareous Mahafaly Plateau, which runs from near Toliara south to Androka. This region of Madagascar is ornithologically poorly known and has not been the focus of any thorough inventory. Other species of vertebrates, such as the recently described carnivore *Galidictis grandidieri* (Wozencraft 1986, Goodman 1996), are known to have a parallel geographic distribution.

Acknowledgements

We are most grateful to curators of various museums who made material available for study: G. Barrowclough and M. LeCroy, AMNH; M. Walters, BMNH; J.-F. and C. Voisin, MNHN. Goodman's visit to the American Museum of Natural History was made possible by a grant from the Frank M. Chapman Fund. T. Schulenberg kindly made available photographs. We are grateful to Olivier Langrand and Tom Schulenberg for comments on an earlier version of this MS.

References:

Appert, O. 1968. La répartition géographique des vangidés dans la région du Mangoky et la question de leur présence aux différentes époques de l'année. *Oisseau* 38: 6–19.

Appert, O. 1970. Zur Biologie der Vangawürger (Vangidae) Sudwest-Madagaskars. *Orn. Beob.* 67: 101–133.

Eguchi, K., Yamagishi, S. & Randrianasolo, V. 1993. The composition and foraging behaviour of mixed species flocks of forest-living birds in Madagascar. *Ibis* 134: 91–96.

Goodman, S. M. 1996. A subfossil record of *Galidictis grandidieri* (Herpestidae: Galidiinae) from southwestern Madagascar. *Mammalia* 60: 150–151.

Hawkins, A. F. A. 1994. Forest degradation and the western Malagasy forest bird community. Ph.D. thesis, University of London.

Langrand, O. 1990. *Guide to the Birds of Madagascar.* Yale Univ. Press.

Milon, P., Petter, J.-J. & Randrianasolo, G. 1973. *Oiseaux. XXXV. Faune de Madagascar.* ORSTOM & CNRS, Tananarive and Paris.

Rand, A. L. 1936. Distribution and habits of Madagascar birds. *Bull. Amer. Mus. Nat. Hist.* 72: 143–499.

Smithe, F. B. 1975. *Naturalist's Color Guide.* American Museum of Natural History, New York.

Wozencraft, W. C. 1986. A new species of striped mongoose from Madagascar. *J. Mammalogy* 67: 561–571.

Yamagishi, S., Eguchi, K., Nakamura, M., Nagata, H. & Randrianasolo, V. 1992. Comparative foraging ecology of Vangids (Vangidae). Pp. 39–45 *in:* S. Yamagishi (ed.), *Social structure of Madagascar higher vertebrates in relation to their adaptive radiation.* Osaka City University, Osaka, Japan.

Address: Steven M. Goodman, Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, Illinois 60605, U.S.A. and World Wide Fund for Nature, Aires Protégées, BP 738, Antananarivo (101), Madagascar. A. F. A. Hawkins, BP 8511, Antananarivo (101), Madagascar. Charles A. Domergue, Institut Pasteur, BP 1274, Antananarivo (101), Madagascar.